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High Power PEMFC Backup Power Systems

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Fuel Cells and Hydrogen Joint Undertaking (FCH JU)

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HELION

AREVA

Summary

- **Helion presentation**
- Helion Back up power system
- The indoor system
- The outdoor system
- Conclusions

HELION, AREVA R Subsidiary

Wind power

Offshore wind energy

MULTIBRID

Bioenergies

Biomass power plant design & integration business

KOBLITZ

Hydrogen power

Supply energy for transportation and manufacturing

HELION

Helion develops, builds and commercializes power generators based on hydrogen and fuel cell power for distributed power generation and mobile applications

HELION Hydrogen Power

- **HELION develops PEM Fuel Cell and Electrolyser technologies for:**
  - **Backup power applications**
  - **Distributed energy**
  - **Niche transport applications**
  - **Air-independent applications**
  - **Education**
  - **Hydrogen production**


Why back up
power systems ?
A response to black outs

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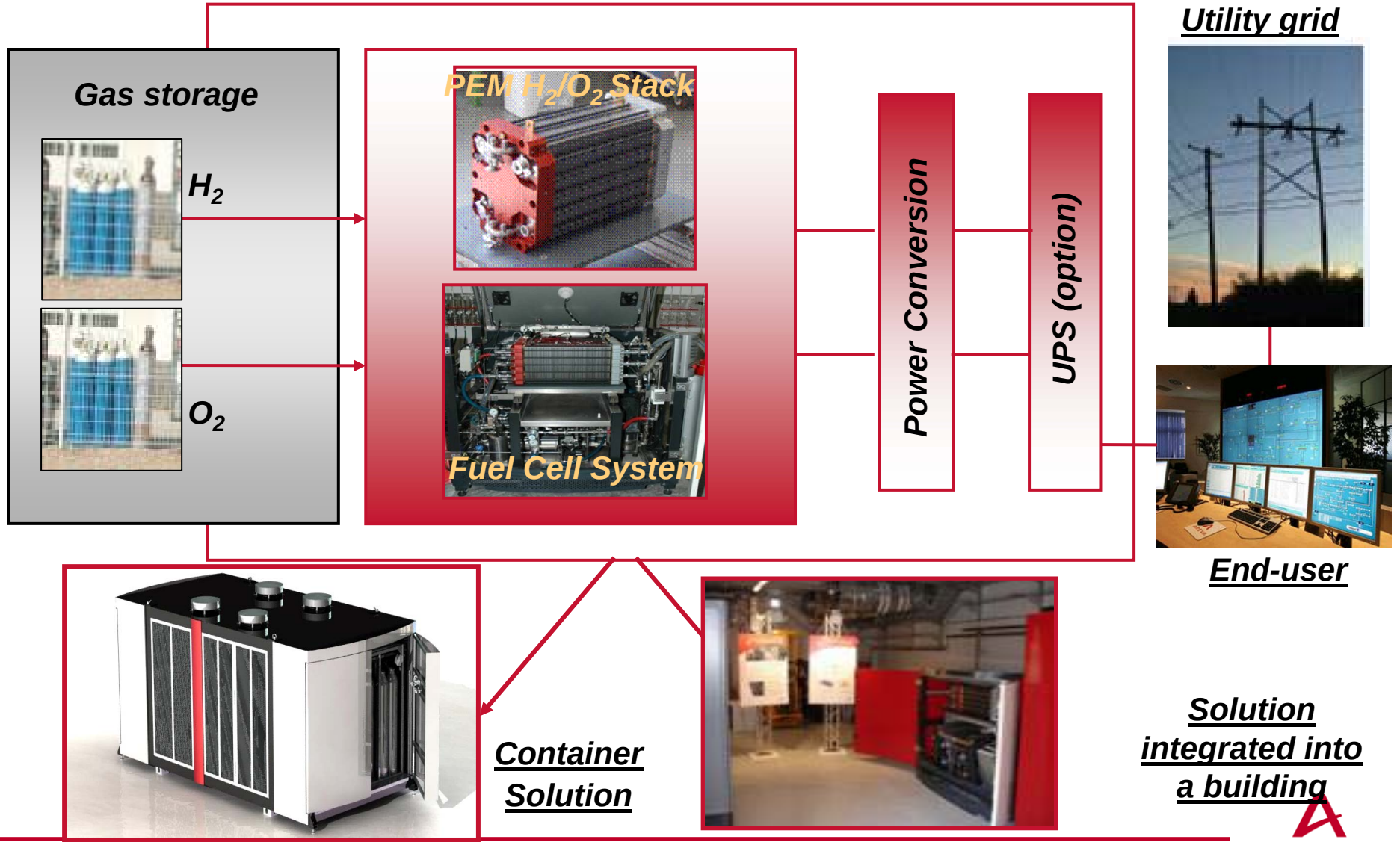
Fuel Cell Backup Power Systems
HELION solution



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Target markets

When constant electricity supply is becoming increasingly important

Telecoms

Risk: loss of clients, network failure during natural disaster

Industries

Risk: Accident and loss of operation

Data centers

Risk: loss of information

Health

Risk: human loss

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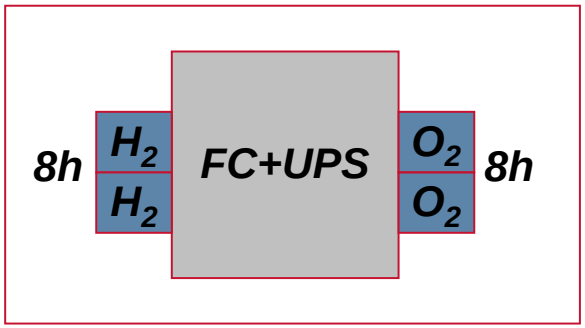
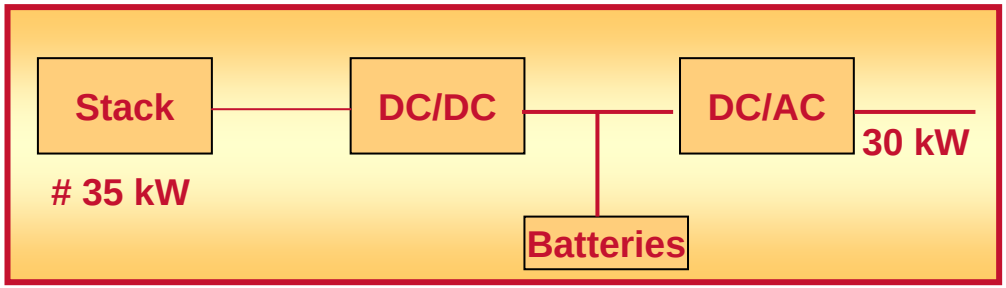
PEM Fuel Cell Backup Power Systems
The indoor system

- **30 kWe H_2/O_2 backup power system in a real use situation**



HELION SAS backup power system has been operating for 3 years at the headquarters of CEA SACLAY. It supplies 400V three-phase for the nuclear crisis unit which represents 30kWe at UPS output.

SAS system is connected to a H2/O2 storage compressed in bottles of 200 bars allowing an operating capacity of 8 hours.



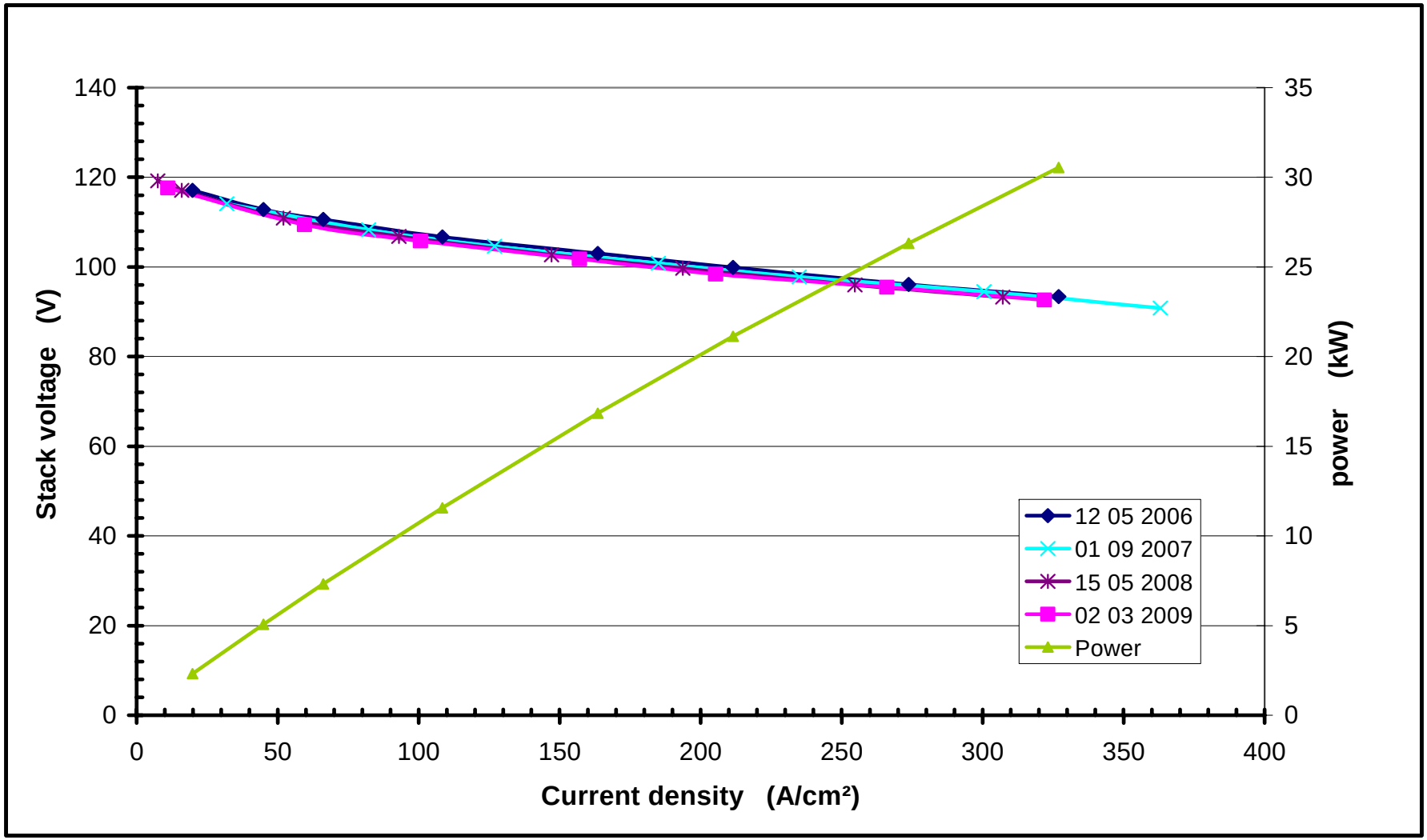
PEM Fuel Cell Backup Power Systems
The indoor system

High experimental feedback

- Very high start-up reliability,
- No performances degradation
- Low maintenance: only 1 visit per year
- Easy use
- Start-up number : 169

	Preliminary tests in HELION	Test since commissioning in Saclay	Total
System start-up number	25	144	169
Operating time	61h10	29h47	90h57
Standby mode time	2592h	21328h	23920h

Stack performances in real use operation



No degradation since installation in 2006

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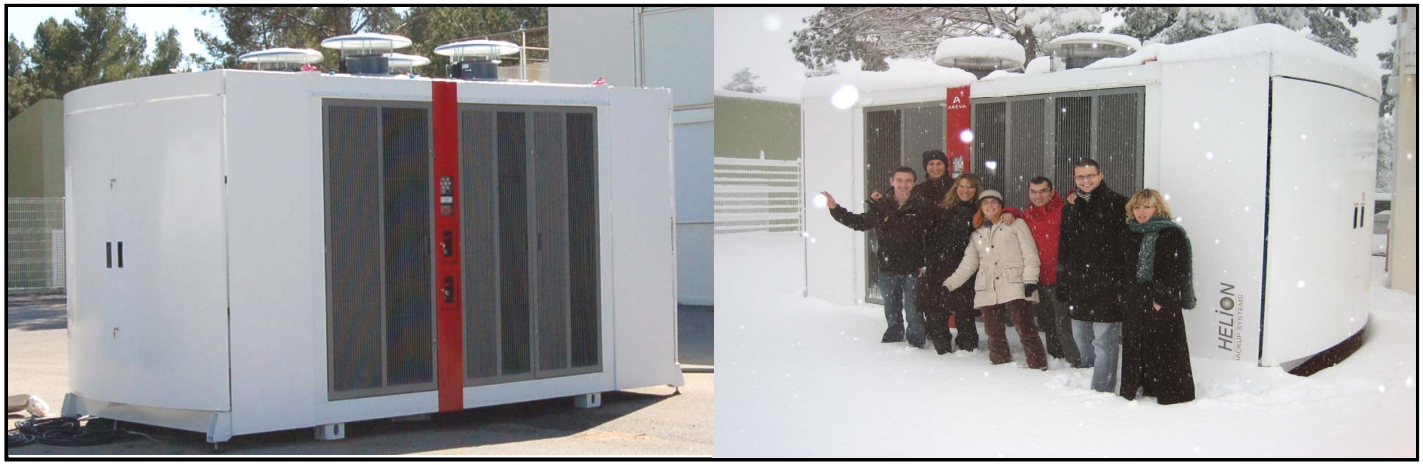
PEM Fuel Cell Backup Power Systems
The outdoor system

- **30kW system installed on Helion site since December 2008**
- **Secure high temperature electrolyzis test benches**
- **Gaz storage = 4hours autonomy**

- **Datas:**
- *First containerized version*
- *New MEA generation (improved performances and durability)*
- *System running time ~ 200h*
- *System start-up ~ 50*
- *No performances decrease*
- *In manufacture: 80 kW in a same volume*



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Conclusions

- **The systems match the customer's specifications**
- **Two PEMFC UPS systems developed by Helion are in service since 2006 and 2008**
- **No IV curve degradation**
- **The commercialization : The increase of fuel price is a favorable factor for the commercialization.**
- **Today there is already a real market:**

In telecom (fuel cells back-up power already installed in India)

Contact

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HYDROGEN POWER

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